Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (previously presented): A pharmaceutical composition comprising at least one modified mRNA that encodes at least one polypeptide, wherein the polypeptide is biologically active or antigenic, and a pharmaceutically compatible carrier and/or vehicle, wherein said modified mRNA encoding the polypeptide comprises an increase in Guanine/Cytosine (G/C) content relative to that of a wild type mRNA encoding the polypeptide, wherein the modified mRNA comprises a maximum G/C content, and the wild type mRNA and the modified mRNA encode a polypeptide comprising an identical amino acid sequence; and wherein said modified mRNA encoding the polypeptide comprises a substitution wherein at least one codon recognized by a rare cellular tRNA is replaced by a codon recognized by an abundant cellular tRNA, and said abundant and rare cellular tRNAs recognize the same amino acid.

2-3. (canceled)

4. (previously presented): The pharmaceutical composition according to claim 1, wherein the modified mRNA encoding the peptide or polypeptide comprises a sequence wherein each codon of the wild type sequence recognized by a rare cellular tRNA is replaced with a codon recognized by an abundant cellular tRNA.

5. (canceled)

6. (previously presented): The pharmaceutical composition according to claim 1, wherein the modified mRNA encoding the polypeptide comprises a sequence wherein the number of destabilising sequence elements is reduced relative to that of a wild type sequence, wherein said destabilizing sequence elements are selected from the group consisting of 3' untranslated region AU-rich sequences and 3' untranslated region GAACAAG sequences.

7. (previously presented): The pharmaceutical composition according to claim 6 wherein the modified mRNA encoding the polypeptide comprises a sequence having no destabilising sequence elements, wherein said destabilizing sequence elements are

selected from the group consisting of 3' untranslated region AU-rich sequences and 3' untranslated region GAACAAG sequences.

8. (previously presented): The pharmaceutical composition according to claim 1 wherein the modified mRNA comprises a 5' cap structure and/or a poly-A tail of at least 70 nucleotides and/or an internal recognition entry site (IRES).

9. (original): The pharmaceutical composition according to claim 1, wherein the modified mRNA comprises at least one analogue of a naturally occurring nucleotide.

10. (original): The pharmaceutical composition according to claim 9, wherein the analogue is selected from the group consisting of phosphorus thioates, phosphorus amidates, peptide nucleotides, methylphosphonates, 7-deazaguanosine, 5-methylcytosine and inosine.

11. (previously presented): The pharmaceutical composition according to claim 1, wherein the at least one polypeptide is selected from the group consisting of a growth factor, a tumour antigen, a viral antigen, a bacterial antigen and a protozoal antigen.

12. (original): The pharmaceutical composition according to claim 11, wherein the viral, bacterial or protozoal antigen is a secreted polypeptide.

13. (original): The pharmaceutical composition according to claim 11, wherein the polypeptide is a polyepitope.

14. (original): The pharmaceutical composition according to claim 13, wherein the polypeptide is selected from the group consisting of a tumour antigen, a viral antigen, a bacterial antigen and a protozoal antigen.

15. (original): The pharmaceutical composition according to claim 1, wherein the modified mRNA further encodes at least one cytokine.

16. (original): The pharmaceutical composition according to claim 1, wherein the pharmaceutical composition further comprises at least one cytokine.

17. (withdrawn): A method for vaccinating a subject against an infectious disease or cancer, the method comprising inoculating the subject with a pharmaceutical composition according to claim 1, wherein the inoculating elicits an immune response in the subject, thereby vaccinating the subject against the infectious disease or cancer.

18. (withdrawn): A method for promoting tissue regeneration in a subject, the method comprising administering a pharmaceutical composition of claim 1 to the subject, wherein the administering promotes tissue regeneration in the patient.

19. (withdrawn): A method for modifying a nucleic acid sequence to generate a modified nucleic acid sequence having altered properties, wherein the nucleic acid sequence and the modified nucleic acid sequence encode an identical peptide or polypeptide, the method comprising:

(a) generating a virtual translation of the nucleic acid sequence to produce an amino acid sequence encoded by the nucleic acid sequence;

(b) generating a virtual reverse translation of the amino acid sequence to determine all codon sequences capable of encoding each amino acid of the amino acid sequence;

(c) increasing Guanine/Cytosine (G/C) content of the virtual reverse translation and/or increasing a frequency of codons recognized by abundant cellular tRNAs in the virtual reverse translation,

wherein increasing the G/C content and increasing the frequency of codons recognized by abundant cellular tRNAs in the virtual reverse translation is performed using selection lists and optimisation algorithms, and the selection lists and optimisation algorithms are executed using a computer having a software program capable of generating a modified nucleic acid sequence having altered properties.

20. (withdrawn): The method according to claim 19, wherein the nucleic acid sequence is an mRNA sequence.

21. (withdrawn): The method according to claim 19, further comprising incorporating naturally occurring stable sequences into the virtual reverse translation.

22. (withdrawn): The method according to claim 19, further comprising reducing the number of destabilising sequence elements in the virtual reverse translation.

23. (withdrawn): The method according to claim 19, wherein the software program comprises a source code of Appendix I.

24-28. (canceled)

29. (previously presented): The pharmaceutical composition according to claim 1, wherein the polypeptide is a tumour antigen.

30. (previously presented): A pharmaceutical composition comprising at least one modified mRNA that encodes at least one polypeptide, wherein the polypeptide is biologically active or antigenic, and a pharmaceutically compatible carrier and/or vehicle, wherein said modified mRNA encoding the polypeptide comprises an increase in Guanine/Cytosine (G/C) content relative to that of a wild type mRNA encoding the polypeptide, wherein the modified mRNA comprises a maximum G/C content, and the wild type mRNA and the modified mRNA encode a polypeptide comprising an identical amino acid sequence.

31. (previously presented): A pharmaceutical composition comprising at least one modified mRNA that encodes at least one polypeptide and a pharmaceutically compatible carrier and/or vehicle, wherein said modified mRNA encoding the polypeptide comprises an increase in Guanine/Cytosine (G/C) content relative to that of a wild type mRNA encoding the polypeptide, and wherein the polypeptide is a tumour antigen.

32. (previously presented): The pharmaceutical composition according to claim 31, wherein the modified mRNA encoding the tumour antigen comprises and increase in G/C content, wherein said G/C content is increased at least 15% relative to that of the wild type mRNA encoding the tumour antigen.

33. (previously presented): The pharmaceutical composition according to claim 31, wherein the modified mRNA encoding the tumour antigen comprises a sequence wherein at least one codon of a wild type sequence recognized by a rare cellular tRNA is replaced with a codon recognized by an abundant cellular tRNA, and wherein said rare cellular tRNA and said abundant cellular tRNA recognize the same amino acid.

34. (previously presented): The pharmaceutical composition according to claim 31, wherein the modified mRNA encoding the peptide or polypeptide comprises a maximum G/C content and a maximum number of codons recognized by abundant tRNAs.